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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,459	01/15/2004	Shunpei Yamazaki	740756-2702	5047
22204	7590	12/13/2007	EXAMINER	
NIXON PEABODY, LLP 401 9TH STREET, NW SUITE 900 WASHINGTON, DC 20004-2128			VU, PHU	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/757,459	Applicant(s) YAMAZAKI ET AL.	
	Examiner Phu Vu	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-68 is/are pending in the application.
- 4a) Of the above claim(s) 3,6,9,12,17,20,23,26,29,32,35 and 41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,7,8,10,11,13-16,18,19,21,22,24,25,27,28,30,31,33,34,39-40 and 43-46,55-68, 69-74 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's arguments, see Remarks, filed 8/20/07, with respect to the rejection(s) of claim(s) 1-74 under 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Gyoda US 2002/0063842 and Masazumi US 6331884.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4-5 10-11, 21-22, 24-27, 39-40, 49-50, 57-62, and 67-68 are rejected under 35 U.S.C. 103(a) as being obvious over Sasaki et al US Publication No 2001/0004281 in view of Gyoda US 2002/0063842 in view of Masazumi US 6331884 and further in view of Ishida 6476899.

Regarding claims 1-2, 4-5 and 49-50, and 67-68, Sasaki teaches a manufacturing method of a liquid crystal display device comprising: forming a seal material that surrounds a pixel area (display area see abstract) on a first substrate (fig. 7 step A2 and see abstract (c)); forming a seal material on the second substrate (A2); discharging a plurality of droplets containing a liquid crystal only on a region of the first substrate (fig. 7 step A3 and also see abstract (e)), the region surrounded by the seal

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material; pasting the first substrate and the second substrate (A5 and abstract (f)); and dividing the pasted pair of first and second substrates (A7). Sasaki fails to teach discharging a plurality of droplets by inkjet and under reduced pressure, however Gyoda teaches discharge of a liquid crystal layer by inkjet in a vacuum that provides discharge with high accuracy [0107]. Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use an ink-jet nozzle for discharge under a vacuum to gain high accuracy discharge. The references fail to teach discharging the seal material by ink-jet however, Ishida teaches resin sealing members that are disposed by ink-jet (see column 8 lines 22-42). It would have been obvious to one of ordinary skill in the art to dispense the seal material by inkjet to gain high accuracy discharge as in liquid crystal and also allow for seal material dispensing without the requirement for additional hardware. Regarding claims 4-5, and 49-50, Sasaki fails to teach dropping the liquid crystal is discharged from a plurality of moving nozzles. Masazumi teaches discharges dropping from a plurality of movable nozzles to allow for precise dropping to provide precise dropping to specific pixels which is advantageous for making certain types of cholesteric LC displays (see column 16 lines 30-67). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to drop LC via a plurality of moving nozzles to provide precise dropping to specific pixels allowing for improved fabrication of specific types of liquid crystal such as reflective cholesteric.

Regarding claims 10-11, , Sasaki teaches pasting occurring under reduced pressure (step f).

Regarding claims 21-22 and 57-58, Sasaki teaches liquid crystal applied intermittently which is interpreted as separate droplets (see abstract (e)).

Regarding claims 24-25 and 59-60, the American Heritage College Dictionary defines continuous as uninterrupted in time, sequence, substance or extent. There since the dropping is uninterrupted in sequence it is considered continuous since no other steps occur during dropping (see abstract (e)). Also claims 24 and 25 depend on claims 1 and 2 which recite the limitation "plurality of droplets" which further support this interpretation.

Regarding claims 26-27, 61-62, the reference teaches the LCD being an active matrix display (see [0176] "active elements").

Regarding claims 39-40, the reference teaches a liquid crystal display incorporated in a "display device" as a liquid crystal display which is a "display device."

Claims 7, 8, and 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki in view of of Gyoda US 2002/0063842 in view of Masazumi US 6331884 in view of Ishida in view of Nishiguchi et al US Patent No 6226067.

Regarding claims 7-8 and 51-52, the references disclose all the limitations of claims 7-8 and 51-52 except a heating step during liquid crystal discharging. Nishiguchi discloses heating of the first substrate during dropping to facilitate a state of equilibrium (stability) in the liquid crystal (see column 18 lines 1-15). Therefore, at the time of the

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invention, it would have been obvious to one of ordinary skill in the art to heat the substrate to enhance stability in the liquid crystal.

Claims 13-14 and 55-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki in view of Gyoda in view of Masazumi in view of Ishida in view of Inoue et al US Publication No 2003/0090609.

Regarding claims 13-14, and 55-56, the references disclose all the limitations of claims 13-14 and 55-56 except, the liquid crystal droplets over a pixel electrode under reduced pressure. Inoue discloses use of dropping liquid crystal under a vacuum to form large array and opposing substrates in a short amount of time (see [0112]). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to expedite the transfer of liquid crystal to the substrates.

Claims 15-16 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki in view of Gyoda in view of Masazumi in view of Ishida in view of Inoue and further in view of Inou et al US Patent No 6639647.

Regarding claims 15-16 and 18-19, the references disclose all the limitations of claims 15-16 and 18-19 except dropping of liquid crystal under a vacuum of 1×10^2 Pa to 2×10^4 Pa or 1 Pa to 5×10^4 Pa. Inoue discloses use of dropping liquid crystal under a vacuum to form large array and opposing substrates in a short amount of time (see [0112]). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to drop the liquid crystals in a vacuum to form large array and opposing substrates in a short amount of time.

Inou discloses that 100 Pa is can be achieved by rotary pumps or general purpose vacuum pumps and does not require a special type of pump (see column 6 lines 37-60). Therefore, it would have been obvious to one of ordinary skill to drop liquid crystal in a pressure of 100 Pa which falls in both claimed ranges because this pressure is the lowest achievable without resorting to a special pumps.

Claims 30-31 and 63-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki of Gyoda in view of Masazumi in view of Ishida in view of Yokono et al US Patent No 4773737

Regarding claims 30-31 and 63-64, the references teach all the limitations of the claims except a passive matrix display. Yokono discloses that passive matrix displays only require a simple driving system (see column 4 line 33-39). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use a passive matrix display to achieve a simple driving system.

Claims 43, 45, are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki of Gyoda in view of Masazumi in view of Ishida and further in view of Yamada 2002/0027636.

Regarding claims 43, 45, the references teach all the limitations of claims 43, 45 and 47 except a plastic substrates. Yamada discloses use of a PET substrate that is flexible (see [0008] and [0094]). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use a plastic substrate to gain flexibility.

Claims 44, 46, are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki in view of Gyoda in view of Masazumi in view of Ishida and further in view of Tamatani 20010052959.

The references teach all the limitations of claims 44, 46, except a filler material including a resin formed between first and second seals however Ishida teaches a spacer formed of resin material (see fig. 3A) between two seals to control gap between the substrates (see column 16 lines 37-40). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to apply a resin spacer between the seal members to improve cell gap control. Ishida teaches ball-type spacers however Tamatani teaches columnar spacers can be precisely patterned [0039]. Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to apply a columnar spacer over a ball-type in order to gain a precisely patterned spacer.

Claims 69, 71-72 are rejected under 35 U.S.C. 103(a) as being obvious over Sasaki et al US Publication No 2001/0004281 in view of Gyoda US 2002/0063842 in view of Masazumi US 6331884 and further in view of Ishida 6476899 and further in view of Koike US 5796458.

Regarding claims 69, 71, Sasaki teaches a manufacturing method of a liquid crystal display device comprising: forming a seal material that surrounds a pixel area (display area see abstract) on a first substrate (fig. 7 step A2 and see abstract (c)); forming a seal material on the second substrate (A2); discharging a plurality of droplets containing a liquid crystal only on a region of the first substrate (fig. 7 step A3 and also

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see abstract (e)), the region surrounded by the seal material; pasting the first substrate and the second substrate (A5 and abstract (f)); and dividing the pasted pair of first and second substrates (A7). Sasaki fails to teach discharging a plurality of droplets by inkjet and under reduced pressure, however Gyoda teaches discharge of a liquid crystal layer by inkjet in a vacuum that provides discharge with high accuracy [0107]. Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use an ink-jet nozzle for discharge under a vacuum to gain high accuracy discharge. The references fail to teach discharging the seal material by ink-jet however, Ishida teaches resin sealing members that are disposed by ink-jet (see column 8 lines 22-42). It would have been obvious to one of ordinary skill in the art to dispense the seal material by inkjet to gain high accuracy discharge as in liquid crystal and also allow for seal material dispensing without the requirement for additional hardware. Regarding claims 4-5, and 49-50, Sasaki fails to teach dropping the liquid crystal is discharged from a plurality of moving nozzles. Masazumi teaches discharges dropping from a plurality of movable nozzles to allow for precise dropping to provide precise dropping to specific pixels which is advantageous for making certain types of cholesteric LC displays (see column 16 lines 30-67). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to drop LC via a plurality of moving nozzles to provide precise dropping to specific pixels allowing for improved fabrication of specific types of liquid crystal such as reflective cholesteric.

The references fail to teach forming an alignment layer via inkjet however, Koiked discloses a patterned alignment layer disposed via inkjet. Therefore, at the time

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of the invention, it would have been obvious to one of ordinary skill in the art to form an alignment layer via ink jet for patterning.

Regarding claims 72, the reference teaches the LCD being an active matrix display (see [0176] "active elements").

Claims 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki in view of Gyoda in view of Masazumi in view of Ishida in view of Koike in view of Nishiguchi et al US Patent No 6226067.

Regarding claims 70, the references disclose all the limitations of claims 7-8 and 51-52 except a heating step during liquid crystal discharging. Nishiguchi discloses heating of the first substrate during dropping to facilitate a state of equilibrium (stability) in the liquid crystal (see column 18 lines 1-15). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to heat the substrate to enhance stability in the liquid crystal.

Claims 74 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki in view of Gyoda in view of Masazumi in view of Ishida in view of Koike in view of Inoue et al US Publication No 2003/0090609.

Regarding claims 13-14, and 55-56, the references disclose all the limitations of claims 13-14 and 55-56 except, the liquid crystal droplets over a pixel electrode under reduced pressure. Inoue discloses use of dropping liquid crystal under a vacuum to form large array and opposing substrates in a short amount of time (see [0112]).

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Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to expedite the transfer of liquid crystal to the substrates.

Claims 73 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki of Gyoda in view of Masazumi in view of Ishida in view of Koike in view of Yokono et al US Patent No 4773737

Regarding claims 73, the references teach all the limitations of the claims except a passive matrix display. Yokono discloses that passive matrix displays only require a simple driving system (see column 4 line 33-39). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use a passive matrix display to achieve a simple driving system.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu Vu whose telephone number is (571)-272-1562. The examiner can normally be reached on 8AM-5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571)-272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Phu Vu
Examiner
2871



David Nelms
Supervisory Patent Examiner
Technology Center 2800

Continuation of Disposition of Claims: Claims rejected are 1,2,4,5,7,8,10,11,13-16,18,19,21,22,24,25,27,28,30,31,33,34,39,40,43-46 and 55-74.